

Flow of Control: Part 2

- Recall that the order in which statements in a program are executed is called the *flow of control*
- So far we have seen *sequential* execution (statements execute one after the other in the order in which they appear in the program) and *branching/selection* control structures/statements (statements are executed conditionally).

Flow of Control: Part 2 cont.

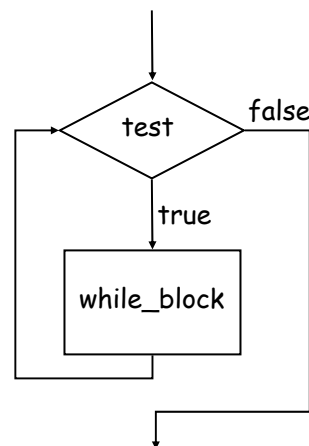
- Consider the following tasks:
 - You want to input a non-zero integer value and want to ensure that the program does not continue until the user has entered a proper value.
 - You input a sequence of values of arbitrary length, and you want to count the number of values and compute the average.
 - Given a string value, you want to find in it *all* occurrences of some given substring.
- How can we write code to perform any of these tasks involving repetition?

Iterative Statements (Loops)

```
Scanner in = new Scanner(System.in);
System.out.print(
    "Enter a non-zero integer: ");
int nonZeroInt = in.nextInt();
while (nonZeroInt == 0) {
    System.out.println(
        "Error: non-zero integer expected");
    System.out.print(
        "Enter a non-zero integer: ");
    nonZeroInt = in.nextInt();
}
```

While: Syntax and Flow Chart

```
while ( test )
{
    while_block
}
```



An Example

- Write a program segment that reads a sequence of integers until a 0 is encountered, and computes and outputs the sum of the numbers read.

Your Turn

- Write a program segment that reads a sequence of integers until a 0 is encountered, and counts and outputs the number of even and the number of odd numbers read (not including the final 0).

Count Odd/Even

Your Turn, Again

- Write a program segment that given a String variable *str* and a character variable *ch*, counts and outputs the number of occurrences of character *ch* in String *str*.

Count Character

Your Turn, One More Time

- Write a program segment that given two integer variables, *width* and *height*, outputs a rectangle of '+'s of the given width and height.
- Start by solving a simpler problem: given integer variable *width*, output *width* '+'s on one line.

Output One Row Of '+'s

- How are we going to output *height* rows of *width* columns of '+'? In other words, how do we repeat the code above *height* times?

Output A Rectangle Of '+'s